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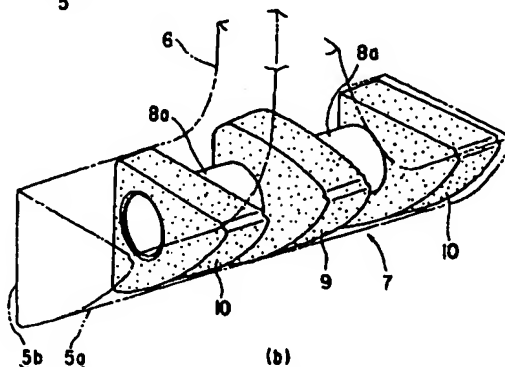
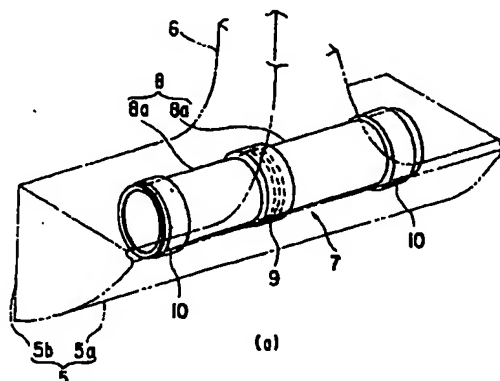
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(54)【発明の名称】 車両用補強子で補強されたボディ構造およびその補強子のボディ組付方法

(57)【要約】

【目的】本発明は、固定手段および発泡材充填作業を必要とせず、目的とする部分が合理的に補強されたボディを得ることにある。

【構成】ボディ1を構成するボディ構成部品としてのサイドソシル5内に、ボディの焼付け塗装の熱と反応して閉断面部分で固定可能な、補強心材8の外周部に熱硬化型発泡シート9、10を貼付してなる補強子7を設置したこと。これによって、できるだけ手間をかけず、かつ簡単にして、目的とする部位が補強されたボディ1を得られる。



# **PATENT ABSTRACTS OF JAPAN**

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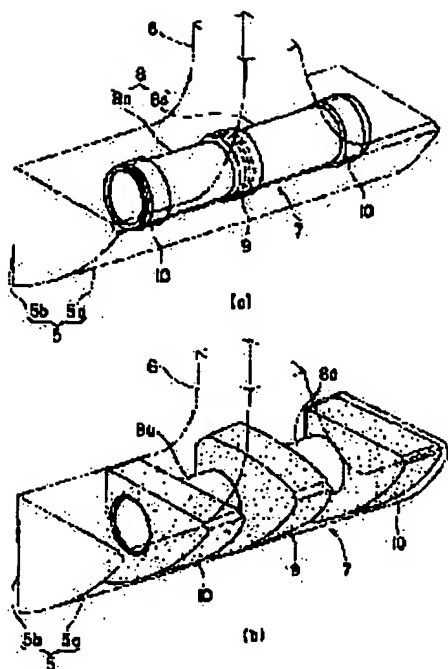
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(54) BODY STRUCTURE REINFORCED BY CAR REINFORCEMENT AND  
ASSEMBLING METHOD THEREFOR



(57)Abstract:

PURPOSE: To secure a body whose aimed part is rationally reinforced, without requiring any locking means and foaming material filling operations.

CONSTITUTION: A reinforcer 7 made up of sticking two thermosetting foaming sheets 9 and 10 to a peripheral part of a reinforcing core 8 being fixable at a closed sectional part as reacting to heat of the baking finish of the body, is set up in a side sill 5 as the body constituent parts constituting the body. With this constitution, dispensing with time and labor, insofar as possible, and simply, the body whose aimed part is well reinforced can thus be secured.

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[Claim(s)]

[Claim 1] the body and the reinforcement which stuck in a heat-hardened type foaming sheet to the periphery section – the body structure reinforced with the reinforcement child for vehicles who consists of a core, is installed in the body component part which sets like the erector of the aforementioned body and has a closed-section portion, possesses the reinforcement child fixed when the aforementioned heat-hardened type foaming sheet reacts with the heat of the heating foaming process of the aforementioned body, and is characterized by the bird clapper

[Claim 2] the inside of the body component part which sets like a body erector and has a closed-section portion – reinforcement – the method with a body group of the reinforcement child characterized by making the aforementioned heat-hardened type foaming sheet foam with the heat of this process in the process to which the reinforcement child who comes to stick a heat-hardened type foaming sheet on the periphery section of a core is installed, and baking finish of the body is carried out

#### [Detailed Description of the Invention]

[0001]

[Industrial Application] this invention relates to the method with a body group of the body structure reinforced with the reinforcement child for vehicles by whom the body composition member which has a closing cross-section portion was reinforced with the reinforcement child, and its reinforcement child.

[0002]

[Description of the Prior Art] Raising the rigidity of the body is advanced by automobile. To reinforce each part of the body lightly and firmly is needed for this. Since many body component parts which have a closed-section portion are used especially for the body, reinforcement of this body component part is advanced.

[0003] However, it is performed that devise this portion from before and it reinforces a said division article since an operator's hand does not arrive. The pouring pipe d was inserted from the pore prepared in the side sill b, and reinforcement of the side sill b which constitutes the body a of the automobile shown in drawing 11 was made specifically conventionally filled up with Foam e in a side sill b from this pouring pipe d, after installing the pipe-like reinforcing materials c along the inside of a side sill b so that it may illustrate on the right-hand side of drawing 12 .

[0004] And it is made to reinforce the side-sill portion which needs reinforcement by the reinforcing materials c fixed by foaming of this foam e in a closed-section portion, and the foam e to which it foamed within the closed-section portion.

[0005]

[Problem(s) to be Solved by the Invention] However, in case the method of such reinforcement is installed in the body component part aiming at reinforcing materials c, the means separately fixed so that reinforcing materials c may not be carelessly moved within this body component part are required for it.

[0006] And after installing reinforcing materials c, it is necessary to make it separately filled up with Foam e into the closed-section portion of a body component part using a restoration means. since Foam e is not injected into other portions (i.e., in order to obtain rigid strengthening by foam restoration efficiently), the means which make a closed space the part of the body component part which it is going to reinforce are made into the need, and the technology of moreover pouring in Foam e from the pouring pipe d has the difficulty of requiring time and effort (man day) considerably

[0007] For this reason, it simplifies and the technology in which a target body component part can be reinforced is demanded. The place which this invention was made paying attention to such a situation, and is made into the purpose is to provide the means row to fix with the method with a body group of the body structure reinforced with the reinforcement child for vehicles who can reinforce the portion simply made into the purpose of the body, without needing the work separately filled up with foam, and its reinforcement child separately.

[0008]

[Means for Solving the Problem] the heat of the heating foaming process of the body, and the reinforcement fixed in the aforementioned closed-section portion in response to the inside of the body component part which has the closed-section portion from which invention according to claim 1 constitutes the body in order to attain the above-mentioned purpose – it is in having installed the reinforcement child who comes to stick a heat-hardened type foaming sheet on the periphery section of a core

[0009] the body composition which sets like a body erector and has a closed-section portion in order that invention according to claim 2 may offer the method of reinforcing each part of the body with a few man day in addition to the above-mentioned purpose – a member – inside – reinforcement – the reinforcement child who comes to stick a heat-hardened type foaming sheet on the periphery section of a core stations, and it is to having made this reinforcement child's aforementioned heat-hardened type foaming sheet foam with the heat in the process to which baking finish of the body is carried out

[0010]

[Function] According to invention according to claim 1, the parts which constitute the body component which sets like a body erector and is made into the purpose which it is going to reinforce are made to only paste using the adhesion (adhesion) nature which a

heat-hardened type foaming sheet has, and positioning is completed, without requiring the means to fix separately.

[0011] moreover, the heat which generates the reinforcement child who incorporated in this body component part at the heating foaming process of the body – a heat-hardened type foaming sheet – reacting – foaming – reinforcement – a core is fixed in a closed-section portion

[0012] It becomes possible separately to reinforce the portion made into the purpose of the body, without needing the work filled up with a fixed means and foam only with the structure which has stationed the reinforcement child in the body component part made into the purpose which it is going to reinforce by this.

[0013] the reinforcement which a heat-hardened type foaming sheet foams in a part for the said division, and is in a said division part by according to invention according to claim 2 stationing a reinforcement child in the body component part made into the purpose which it is going to reinforce, and leaving the body to a baking finish process after that – the core is fixed

[0014]

[Example] Hereafter, this invention is explained based on the 1st example shown in drawing 1 or drawing 6. One in drawing 1 shows the body with which this invention was applied and which constitutes a four-door type passenger car, for example.

[0015] The body 1 has an engine room 3 in the anterior part of the vehicle room 2 where it was equipped with door 2a, and has the trunk room 4 at the posterior part. The state before going into the fitting process at which this body 1 was set like the body erector, and paint was made in attachment of each part and the dryness process [it is hereafter called a "baking finish process" (equivalent to the heating foaming process of this application)] after being electrodeposited liquid immersed is shown.

[0016] The reinforcement child 7 was formed in the portion which crosses the center pillar -6 of a side sill 5 used as the part which reinforcement requires among the parts which have the closed-section portion which constitutes this body 1, and a part for the said division is reinforced.

[0017] reinforcement of the shape of a pipe which has the size which can be installed in a side-sill portion here as the reinforcement child 7 is shown in drawing 2 (a) if this reinforcement child 7 is explained – it has the core 8

[0018] the above-mentioned reinforcement – the structure which connected the empty cans 7a and 8a of two soft drinks in series is used for the core 8 As the taste (not shown) comrade who did opening is specifically compared, two empty cans 8a and 8a are put in order in series, the adjoining edge comrade is combined by pasting (twisting) of the

band-like heat-hardened type foaming sheet 9 (it is because there is adhesiveness in the heat-hardened type foaming sheet 9), and the structure which carried out the seal of the part for the said division is adopted. This is because it comes out enough by the empty cans 8a and 8a whose length of the part to reinforce is two and was made for liquids, such as electrodeposited liquid, not to invade in a certain thing, and empty can 8a and 8a.

[0019] Of course, the can of the appearance freely arranged in the closed section of a side sill 5 is used for empty cans 8a and 8a. this reinforcement – it is located in the ends periphery section and the band-like heat-hardened type foaming sheets 10 and 10 are twisted around the periphery section of a core 8 by pasting

[0020] the reinforcement child's 7 whole – such reinforcement – it is constituted by the attachment of the heat-hardened type foaming sheets 9 and 10 to a core 8 This reinforcement child 7 sets like a body erector, and positioning arrangement has been carried out at the above-mentioned lumen portion of a side sill 5.

[0021] The foaming sheet of the function to which it foams in response to the heat in the case of the baking finish process of the above-mentioned body 1 is used for each above-mentioned heat-hardened type foaming sheets 9 and 10. it is shown in drawing 2 (b) using the function of these heat-hardened type foaming sheets 9 and 10 – as – reinforcement – a core 8 – reinforcement – the core 8 is fixed in the closed-section portion of the side-sill portion which crosses a center pillar -6

[0022] and the reinforcement fixed to the local portion of this side sill 5 – how to attach the reinforcement child 7 in a side sill 5 is explained to the next which has reinforced the side-sill portion which crosses a center pillar -6 with a core 8 and the heat-hardened type foaming sheets 9 and 10 on which it foamed within the closed-section portion of a sole bar 5

[0023] Here, since the reinforcement child 7 has diverted and attached the process until the body 1 is done, before he explains a method with a group, he explains the flow of the body 1 briefly. That is, the body 1 of a passenger car is set like a BOTI erector as known, and the whole is assembled as shown in drawing 1 . Then, it goes into a paint line. And the body 1 is a fitting process and a thing which results in a final-assembly process further and serves as a product, after finishing paint through the electrodeposited process of this paint line, and a printing process.

[0024] attachment of the reinforcement child 7 – such a flow – setting – first – reinforcement child 7[before foaming – it installs in the side sill 5 which becomes drawing 2 (a) with the skeleton of the body in the process which assembles the body 1 as illustration] is shown in the flow chart shown at drawing 3 and which crosses a center pillar -6

[0025] This is performed as follows. That is, the said heat-curing type foaming sheets 9 and 10 are stuck on the inside of side-sill outer panel 5a which constitutes a side sill 5, and it is made to support the whole reinforcement child 7 before the assembly of a side sill 5 using the adhesiveness of the heat-hardened type foaming sheets 9 and 10, as shown in drawing 4.

[0026] If this side-sill outer panel 5a is attached in side-sill inner panel 5b and a side sill 5 is assembled by this in the case of [ like a body erector ], the whole reinforcement child 7 is installed in the closed-section portion of the side-sill portion which crosses a center pillar -6 as shown in drawing 5 (a) and (b). Wearing of door 2a is also performed like this body erector.

[0027] Subsequently, after ending like a body erector, the body 1 is led to an electrodeposited process and electropainting is given to the front face of the body 1. Then, the body 1 which finished electropainting is led to a baking finish process. Thereby, heating of high temperature dries and paint is baked.

[0028] Since the sheet reacted to the heat of a printing process is adopted as the reinforcement child's 7 heat-hardened type foaming sheets 9 and 10 at this time, with the heat in the case of this printing process, as shown in drawing 2 (b) and drawing 6 (a), and (b), it foams on the heat-hardened type foaming sheets 9 and 10, and they are hardened.

[0029] then, reinforcement – the core 8 is fixed in the predetermined position in the closed-section portion of a side sill 5 with the heat-hardened type foaming sheets 9 and 10 on which it foams thereby – a side sill 5 – reinforcement – a core – it is reinforced with the foam which carried out foaming hardening by 8 rows

[0030] the \*\* which does not require separately a means to fix, by the reinforcement child's 7 adoption the heat-hardened type foaming sheets 9 and 10 were used for this [ whose ] – reinforcement – the work separately filled up with foam when positioning arrangement of a core 8 is completed, and the \*\* which does not need a heating process further separately – the predetermined position in a closed-section portion – reinforcement – it enables a core 8 to fix

[0031] Therefore, the body component part which had spent the man day of former many and which has a closed-section portion can be reinforced with easy work by the reinforcement child 7. and the empty cans 8a and 8a – reinforcement – the structure of using for a core 8 can utilize resources effectively, and can reinforce the part made into the purpose of the body 1 And since rigid intensity higher than the time of only using a pipe-like member can also be hung down by the end wall in the edge of empty can 8a, the effect is size.

[0032] Moreover, the body 1 reinforced with such a reinforcement child 7 The body



component 5, i.e., the side sill combined with the lower part of a center pillar -6, to reinforce in the case of [ like a body erector ] Since a required part is reinforced with the structure of stationing the reinforcement child 7 in the side sill [ near / this / the opening ] 5 also in a portion for which the on-the-strength reinforcement by foaming restoration which has opening which led to this pillar 6 is difficult, the body 1 reinforced rationally is obtained.

[0033] Moreover, the method of attaching the reinforcement child 7 to the body 1 as mentioned above is a few man day, and can reinforce a body component to reinforce most rationally.

[0034] in addition, the reinforcement which compared empty cans 8a and 8a in the 1st example – between the empty cans 8a and 8a although the core 8 was used, as shown not only in this but in drawing 7 (a) – Crevice delta and the detached reinforcement – the pipe 11 as shown in drawing 7 (b) also by the core 8 – reinforcement – you may use as a core 8 [0035] of course, \*\*\*\* 12 with the appearance which was similar to the closed-section configuration of a side sill 5 as shown in drawing 8 – reinforcement – as a core 8 – you may use – reinforcement – it is not limited to the configuration of a core 8 moreover, these reinforcement – you may be the tubed part material joined so that bending might be performed to a sheet metal material and it might become a closed-section configuration as a core 8

[0036] Moreover, although the example which applied the side sill 5 for this invention to reinforcement was given in the 1st example, you may apply not only to this but to reinforcement of the parts prolonged in a body cross direction with other closed-section portions, a longitudinal direction, and the vertical direction, and a body component part called in PAKUTOBI-MU (guard member for guarding a door) further built in the door. moreover – the above – reinforcement – although the band-like foaming sheets 9 and 10 were \*\*\*\*(ed) to the core 8 – this sheet – the configuration which is not beltlike – carrying out – said – the whole periphery side surface of a core 8 – a wrap – you may \*\*\*\* like

[0037] A reinforcing-in PAKUTOBI-MU of these example is shown in drawing 9 and drawing 10 . if this example is explained as the 2nd example of this invention, the reinforcement child 7 is illustrated on the right-hand side of the drawing portion which drawing 9 expanded, and drawing 10 – as – strip 8b of the appearance which can be inserted into in PAKUTOBI-MU 15 – reinforcement – a core 8 – carrying out – this reinforcement – it has structure which stuck the band-like heat-hardened type foaming sheet 16 on the both-sides side of a core 8

[0038] In the case of [ like a body erector ], reinforcement equips door 2a with in PAKUTOBI-MU 15 in which the reinforcement child 7 was inserted beforehand, and as the

1st example described after that, it is performed by making the heat-hardened type foaming sheets 16 and 16 foam with the heat of this process, as illustrated on the left-hand side of drawing 10 at the time of a baking finish process.

[0039] However, in drawing 7 or drawing 9 , the same sign was given to the same component as the 1st example mentioned above, and the explanation was omitted. In addition, although the foaming sheet was made to foam in a baking finish process in both the 1st and 2nd example mentioned above, in the process before being electrodeposited liquid immersed, it is possible to also make it foam according to a heating foaming process by the heating foaming process other than a baking finish process.

[0040]

[Effect of the Invention] As explained above, according to invention of a claim 1 and a claim 2, the portion made into the purpose of the body can be separately reinforced with the structure of stationing a reinforcement child in a body component reinforcing easily, without needing a fixed means and the work separately filled up with foam.

[0041] So, the body reinforced rationally can be obtained. And according to invention according to claim 2, in addition to the above-mentioned effect, each part of the body can be reinforced with a few man day.

[Brief Description of the Drawings]

[Drawing 1] The perspective diagram showing the body with which the side sill concerning the 1st example of this invention was reinforced.

[Drawing 2] (a) is the perspective diagram showing the reinforcement child before foaming which reinforces this side sill with the state where positioning arrangement was carried out, in the side-sill portion which center pillar - crosses. (b) is the perspective diagram showing the state where this reinforcement child's heat-hardened type foaming sheet foamed in response to the heat of a baking finish process.

[Drawing 3] Drawing even for diverting the assembly line of the body and a reinforcement child even explaining being fixed in a side sill.

[Drawing 4] Drawing even for a reinforcement child even explaining that positioning arrangement is carried out in this side sill in connection with the assembly of a side sill performed like a body erector.

[Drawing 5] (a) is the front view showing the state where the reinforcement child has been stationed by the assembly of this side sill in the side-sill portion which center pillar - crosses. (b) is this sectional side elevation.

[Drawing 6] (a) is the front view showing the state where a reinforcement child's heat-hardened type foaming sheet foamed in response to the heat of a baking finish process

in this side-sill portion. (b) is this sectional side elevation.

[Drawing 7] (a) and (b) are the front view showing the structure of a reinforcement child different, respectively.

[Drawing 8] Drawing showing a different reinforcement child with the state where the state where this reinforcement child has been stationed in a side sill, and the heat-hardened type foaming sheet foamed.

[Drawing 9] Drawing having shown in PAKUTOBI-MU concerning the 2nd example of this invention with the door.

[Drawing 10] Drawing showing the reinforcement child who reinforces this in PAKUTOBI-MU with the state where the state where this reinforcement child has been stationed in in PAKUTOBI-MU, and the heat-hardened type foaming sheet foamed.

[Drawing 11] The side elevation showing the automobile with which the side sill was reinforced.

[Drawing 12] Drawing for explaining the structure of reinforcing the conventional side sill.

[Description of Notations]

1 – Body 2a – Door

5 – Side sill 5a – Side-sill outer panel

5b – Side-sill inner panel 7 – Reinforcement child

8 – reinforcement – core 9 and 10 – heat-curing type foaming sheet

15 – In PAKUTOBI-MU

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